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Abstract of the national paper of Belarus

On the current status and development prospects of space activity in Belarus

1. Increasing activity in space-related fields and the integration of an ever larger number of States within the space community have emerged as steady trends throughout the world.

2. Space exploration and applications are promoting the development of new advanced technologies and the achievement of improved effectiveness and progress in various areas of industry, agriculture, transport, energy, communications and many other vital spheres of activity.

3. The participation by Belarus in numerous space programmes of the former Union of Soviet Socialist Republics acted as a powerful stimulus to the development of its national scientific-industrial sector.

4. With a view to implementation of those programmes in Belarus, new factories were built, project entities and specialized production lines were established, specially designed equipment was purchased, manufactured and brought into operation, modern techniques for the manufacture of space technology were introduced and collectives were formed of highly qualified scientists, engineers and technicians (from the Institute of Engineering Cybernetics, the Institute of Physics, the Institute of Electronics and the Institute of Heat and Mass Transfer of the National Academy of Sciences of Belarus (NASB), the Scientific Research Institute of Applied Physics of Belarus State University, the Belarusian Optical and Mechanical Consortium and its Peleng Central Design Bureau, the Kamerton Special Design Bureau, the Tsentr Research and Production Consortium, the Izmeritel ("Measure") and Sputnik plants, and many other entities).

5. Since 1991, when Belarus became a sovereign State, scientific and technological work in space-related fields has been financed from national budgetary funds and from orders placed by the Russian Federation.

6. The report provides extensive information on the projects implemented in Belarus in space-related fields.

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7. Among those projects, the Institute of Physics of NASB has designed a series of instruments (MSS-2, MSS-2MB, MSS-2P, SKIF, etc.) that have been used to investigate the spectral and polarization characteristics of radiation scattered by the atmosphere and the Earth's surface. Special methods have also been devised for calculating the influence of the atmosphere in the processing of remote sensing data.

8. The NASB Institute of Engineering Cybernetics was the lead organization in the former Soviet Union for the design of systems, complexes and methods for digital geographical mapping based on satellite data and other cartographic materials. The development of that field has allowed the Institute to continue its work in the area of establishing geoinformation systems.

9. The NASB Institute of Electronics, together with its Ekon Design Bureau and cooperation with Russian organizations, has designed, manufactured and brought into operation the SFM-2 instrument for measuring the vertical section of the Earth's ozone layer in four spectral ranges. SFM-2 instruments were used on METEOR satellites in conjunction with instruments from the United States of America (Meteor-TOMS programme) during the period 1985-1994. The SFM-2 design has recently been modernized for operation on Meteor-3M satellites. Work is also in progress on the design of the SFOR-1 satellite instrument for global monitoring of the Earth's ozone layer and other gaseous constituents with simultaneous mapping of the ozone fields at heights of up to 70 km, together with determination of their vertical profiles. Measurements are being carried out in eight spectral ranges.

10. The A. V. Lykov Institute of Heat and Mass Transfer, an academic scientific complex within NASB, is a leading institution in the field of plasma technology. The powerful Hall accelerator designed by the Institute in collaboration with Russian organizations is used for modelling aerodynamic heating during the flight of space objects in the Earth's atmosphere and in the atmosphere of other planets under conditions closely simulating natural conditions.

11. At the Peleng division of the Belarusian Optical and Mechanical Consortium, the multizonal MK-4M satellite camera installed on the Resurs series of satellites, providing multizonal photographic images of the Earth's surface in four ranges of the optical spectrum, is currently being upgraded. Recently, a new multizonal satellite camera, the Gemma model, has been under development. This camera applies the international standard for photographic images with frame dimensions of 230 x 230 mm, an enlarged photographed area of the Earth's surface, improved resolution and an envisaged automatic exchange between up to 12 spectral zones; in addition, the camera offers automatic exposure regulation and adjustment to take account of cloud cover and other conditions at the time of photography.

12. At Belarus State University, the VFS-3M orbital videophotometric system has been designed for investigating optical radiance in the Earth's atmosphere and ionosphere caused by lightning activity and related to seismic processes. A number of other organizations are involved in the development of methods and systems for processing space information.

13. The development work presented in the report provides evidence of the great scientific and technological potential of Belarus.

14. Belarusian interests in the uses of space and the applications of space technologies encompass a broad spectrum of topics related to the country's national economy. Chief among these are the following:

(a) Use of remote sensing data for the conservation of agricultural, forestry and water resources and for reclamation purposes;

(b) Ecological and radiation monitoring;

(c) Disaster analysis and preparation of aids to decision-making for purposes of disaster prevention or management;

(d) Investigation of natural resources and exploration of mineral resources;

(e) Revision of topographical maps on the basis of satellite images from the Global Navigation Satellite System (GLONASS) and the NAVSTAR Global Positioning System;

(f) Hydrometeorology;

(g) Communications, television broadcasting and satellite navigation;

(h) Use of space technologies for the production of semiconductor materials and their use in the electronics industry and the production of bioactive substances for the pharmaceuticals industry;

(i) Development, manufacture and sale to other States of remote sensing satellite equipment, ground systems for digital processing of space data, optoelectronic systems and rocket trajectory measurement systems, navigational systems and other space instruments and systems developed and manufactured in Belarus in the space sector.

15. International cooperation is crucial to meeting the challenges presented in each of these areas.

16. In order to coordinate work in space-related fields and to ensure cooperation with space agencies in other States and with other international organizations in areas of space activity, a new entity, the National Space Council, has been established in Belarus.

17. The report also provides information on inter-state agreements concluded by Belarus in connection with the exploration and uses of space and on Belarusian participation in international scientific and technological programmes in the field of outer space.